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10/552,399	10/07/2005	Thomas Kohler	PHDE030097US	9293

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER	
CORBETT, JOHN M	
ART UNIT	PAPER NUMBER
2882	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,399	KOHLER ET AL.	
	Examiner	Art Unit	
	JOHN M. CORBETT	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-9,15 and 16* is/are allowed.

6)☒ Claim(s) *10-14 and 17-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 10, 12-14 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grangeat et al. ("Theoretical framework for a dynamic cone-beam reconstruction algorithm on a dynamic particle model", 17 July 2002, Phys. Med. Biol., 47, pages 2611-2625) in view of Kachelriess et al. ("Kymogram detection and kymogram-correlated image reconstruction from subsecond spiral computed tomography scans of the heart", July 2002, Med. Phys., volume 29, number 7, pages 1489-1503) and Cesmeli (6,434,215).

With respect to claim 10, Grangeat et al. teaches a method comprising:

b) forming a number of group from measured values of the object (Figure 1b),

c) determining for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this measured value was acquired (Pages 2618-2120, Section 4.1.3.2, i.e. cartoon like step-by-step motion),

e) reconstructing the absorption distribution in the object from the measured values belonging to the groups (Page 2615, Section 4.1, dynamic region of interest reconstructed).

Grangeat et al. fails to teach determining those groups whose points in time lie within periodic, predefined time ranges.

Kachelriess et al. teaches determining those groups whose points in time lie within periodic, predefined time ranges (Abstract, reconstruction synchronized with cardiac motion).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Grangeat et al. to include the determining of Kachelriess et al., since a person would have been motivated to make such a modification to improve image quality by reducing motion artifacts (Abstract and Page 1501, Col. 1, lines 9-11) as taught by Kachelriess et al.

Grangeat et al. fails to explicitly teach a) determining the spatial area taken up by the object.

Cesmeli teaches a) determining the spatial area taken up by the object in the examination area (Col. 5, lines 45-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the method of Grangeat et al. as modified above the determining of Cesmeli, since a person would have been motivated to make such a modification to improve imaging and reduce reconstruction time by reconstructing an image centered on the region of interest utilizing extracted data for the reconstruction (Col. 5, lines 48-52) as implied by Cesmeli.

With respect to claim 12, Grangeat et al. as modified above suggests the method as recited above. Kachelriess et al. further teaches wherein the periodically moving object is a heart, where the periodic time ranges are predefined with the aid of an electrocardiograph (Abstract).

With respect to claim 13, Grangeat et al. as modified above suggests the method as recited above. Cesmeli further teaches wherein the object moves less in the periodic, predefined time ranges than in other time ranges (Figure 3).

With respect to claim 14, Grangeat et al. teaches an apparatus comprising:

b) means for forming a number of group from measured values of the object (Figure 2),

c) means for determining for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this measured value was acquired (Pages 2618-2120, Section 4.1.3.2, i.e. cartoon like step-by-step motion),

e) means for reconstructing the absorption distribution in the object from the measured values belonging to the groups (Page 2615, Section 4.1, dynamic region of interest reconstructed).

Note: Grangeat et al. necessarily includes the means (via a computer) for forming, determining and reconstructing noted above.

Grangeat et al. fails to teach d) means for determining those groups whose points in time lie within periodic, predefined time ranges.

Kachelriess et al. teaches d) means for determining those groups whose points in time lie within periodic, predefined time ranges (Abstract, reconstruction synchronized with cardiac motion, Page 1490, Col. 2, lines 47-51 and Page 1481, Col. 1, lines 22-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Grangeat et al. to include the means for determining of Kachelriess et al., since a person would have been motivated to make such a modification to improve image quality by reducing motion artifacts (Abstract and Page 1501, Col. 1, lines 9-11) as taught by Kachelriess et al.

Grangeat et al. fails to explicitly teach a) means for determining the spatial area taken up by the object.

Cesmeli teaches a) means for determining the spatial area taken up by the object (Col. 5, lines 45-48 and Figure 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the apparatus of Grangeat et al. as modified above the determining of Cesmeli, since a person would have been motivated to make such a modification to improve imaging and reduce reconstruction time by reconstructing an image centered on the region of interest utilizing extracted data for the reconstruction as implied by Cesmeli (Col. 5, lines 48-52).

With respect to claim 17, Grangeat et al. as modified above suggests the method as recited above. Grangeat et al. further discloses in step c), the measured value for each group corresponds to a beam fan (Figure 1b). Grangeat et al. as modified above necessarily teaches irradiates a center of gravity of the spatial area taken up by the object in the examination area (See Cesmeli at Col. 5, lines 48-52 as noted in rejection of claim 14 above).

With respect to claim 18, Grangeat et al. as modified above suggests the method as recited above. Grangeat et al. further discloses in step c), the measured value for each group corresponds to a beam fan (Figure 1b). Grangeat et al. as modified above necessarily teaches irradiates a center of gravity of the spatial area taken up by the object in the examination area (See Cesmeli at Col. 5, lines 48-52 as noted in rejection of claim 10 above).

With respect to claim 19, Grangeat et al. as modified above suggests the method as recited above. Grangeat et al. as modified above necessarily teaches a time interval between the point in time and an acquisition time of each measured value is such that the reconstruction does not use measured values whose beams were acquired at points in time which lie outside a predefined time range (See Kachelriess et al., Abstract, reconstruction synchronized with cardiac motion, Page 1490, Col. 2, lines 47-51 and Page 1481, Col. 1, lines 22-29 as noted in rejection of claim 10 above).

2. Claims 10-13 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grangeat et al. in view of Kachelriess et al. and Ebrahimifard et al. (6,396,897).

With respect to claim 10, Grangeat et al. teaches a method comprising:

b) forming a number of group from measured values of the object (Figure 1b),

c) determining for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this

measured value was acquired (Pages 2618-2120, Section 4.1.3.2, i.e. cartoon like step-by-step motion),

e) reconstructing the absorption distribution in the object from the measured values belonging to the groups (Page 2615, Section 4.1, dynamic region of interest reconstructed).

Grangeat et al. fails to teach determining those groups whose points in time lie within periodic, predefined time ranges.

Kachelriess et al. teaches determining those groups whose points in time lie within periodic, predefined time ranges (Abstract, reconstruction synchronized with cardiac motion).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Grangeat et al. to include the determining of Kachelriess et al., since a person would have been motivated to make such a modification to improve image quality by reducing motion artifacts (Abstract and Page 1501, Col. 1, lines 9-11) as taught by Kachelriess et al.

Grangeat et al. fails to explicitly teach a) determining the spatial area taken up by the object.

Ebrahimifard et al. teaches a) determining the spatial area taken up by the object in the examination area (102).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the method of Grangeat et al. as modified above the determining of Ebrahimifard et al., since a person would have been motivated to make such a modification to improve imaging in a more simple manner (Col. 1, lines 59-67 and Col. 2, lines 25-28) as taught by Ebrahimifard et al.

With respect to claim 11, Ebrahimifard et al. further teaches wherein the determination of the spatial area taken up by the object, in step a), comprises the following steps:

reconstructing from the measured values a three-dimensional data record which contains the object, with a resolution which makes it possible to segment the object in the three-dimensional data record (100),

segmenting the object in the three-dimensional data record, where the segmented object shows the spatial area taken up by the object in the examination area (102-122).

With respect to claim 12, Grangeat et al. as modified above suggests the method as recited above. Kachelriess et al. further teaches wherein the periodically moving object is a heart, where the periodic time ranges are predefined with the aid of an electrocardiograph (Abstract).

With respect to claim 13, Grangeat et al. as modified above suggests the method as recited above. Grangeat et al. further teaches wherein the object moves less in the periodic, predefined time ranges than in other time ranges (Page 2612, line 3, i.e. heart).

With respect to claim 18, Grangeat et al. as modified above suggests the method as recited above. Grangeat et al. further discloses in step c), the measured value for each group corresponds to a beam fan (Figure 1b). Grangeat et al. as modified above necessarily teaches irradiates a center of gravity of the spatial area taken up by the object in the examination area

(See Ebrahimifard et al. at Col. 1, lines 59-67 and Col. 2, lines 25-28 as noted in rejection of claim 10 above).

With respect to claim 19, Grangeat et al. as modified above suggests the method as recited above. Grangeat et al. as modified above necessarily teaches a time interval between the point in time and an acquisition time of each measured value is such that the reconstruction does not use measured values whose beams were acquired at points in time which lie outside a predefined time range (See Kachelriess et al., Abstract, reconstruction synchronized with cardiac motion, Page 1490, Col. 2, lines 47-51 and Page 1481, Col. 1, lines 22-29 as noted in rejection of claim 10 above).

3. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grangeat et al. in view of Kachelriess et al. and Cesmeli as applied to claim 10 above, and further in view of Vaillant et al. (6,549,606).

With respect to claim 20, Grangeat et al. as modified above suggests the method as recited above. Grangeat et al. further disclose a time interval between the point in time and an acquisition time of each measured value (Pages 2615-2620, Section 4.1TheDynamic ROI Reconstruction Module). Grangeat et al. fails to disclose the reconstruction does not use measured values whose beams do not come into contact with the object.

Vaillant et al. teaches the reconstruction does not use measured values whose beams do not come into contact with the object (Col. 1, lines 35-41 and Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the method of Grangeat et al. as modified above the features of Vaillant et al., since a person would have been motivated to make such a modification to improve the effectiveness of a medical procedure by reducing the reconstruction times needed in reconstructing a selected region of interest such as a stenosis in a coronary artery (Col. 1, lines 6-24) as implied by Vaillant et al.

4. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grangeat et al. in view of Kachelriess et al. and Ebrahimifard et al. as applied to claim 10 above, and further in view of Vaillant et al.

With respect to claim 20, Grangeat et al. as modified above suggests the method as recited above. Grangeat et al. further disclose a time interval between the point in time and an acquisition time of each measured value (Pages 2615-2620, Section 4.1TheDynamic ROI Reconstruction Module). Grangeat et al. fails to disclose the reconstruction does not use measured values whose beams do not come into contact with the object.

Vaillant et al. teaches the reconstruction does not use measured values whose beams do not come into contact with the object (Col. 1, lines 35-41 and Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the method of Grangeat et al. as modified above the features of Vaillant et al., since a person would have been motivated to make such a modification to improve the effectiveness of a medical procedure by reducing the reconstruction times needed in

reconstructing a selected region of interest such as a stenosis in a coronary artery (Col. 1, lines 6-24) as implied by Vaillant et al.

Allowable Subject Matter

5. Claims 1-9 and 15-16 are allowed. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 1, the prior art does not teach or fairly suggest a method including

c) determining for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this measured value was acquired, when taken in combination with the other limitations of the claim. Claims 2-9 and 15-16 are allowed by virtue of their dependency.

Response to Arguments

6. Applicant's arguments, see Page 9, filed 12 February 2008, with respect to claim 9 have been fully considered and are persuasive. The 35 U.S.C. 101 rejection of claim 9 has been withdrawn.

7. Applicant's arguments with respect to claims 17-20 have been considered but are moot in view of the new ground(s) of rejection.

8. Applicant's arguments, see Page 11, lines 16-20, filed 12 February 2008, with respect to at least claim 1 have been fully considered and are persuasive. The 35 U.S.C. 103(a) rejection of claims 1-9 has been withdrawn.

9. Applicant's other arguments filed 12 February 2008 have been fully considered but they are not persuasive.

With respect to at least claims 10 and 14, the Applicant argues that Grangeat et al. fails to disclose for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this measured value was acquired. The Examiner disagrees. Grangeat et al. discloses a step in forming of a group (Figure 1b). Grangeat et al. further discloses for each group (partial block-projection which undergoes a cartoon-like step-by-step motion, Pages 2618-2120, Section 4.1.3.2) a measured value whose beam irradiates the spatial area taken up by the object (the attenuated signal detected at the detector), and allocating to the respective group the point in time (Page 2619, lines 16-17, block time instant t_{ij}) at which this measured value was acquired (times, as noted on Page 2616 by equations 13 and 15, are limited to times which contain measured values making up the blocks). Therefore, Grangeat et al. does disclose for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this measured value was acquired and the claims remain rejected.

With respect to at least claims 10 and 14, in response to Applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., allocating a point in time to each group of parallel rebinned measured values for reconstruction) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. Therefore, the Applicant's argument is not persuasive, and the claims remain rejected.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN M. CORBETT whose telephone number is (571)272-8284. The examiner can normally be reached on M-F 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. M. C./
Examiner, Art Unit 2882

/C. G. K./

/Edward J Glick/
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